

2 BLASTS IN ARCTIC

One Test Under Water —U. S. Wary on Big Explosion's Force

By JOHN W. FINNEY

Special to The New York Times.

WASHINGTON, Oct. 23 — The Soviet Union conducted the largest man-made explosion in history early today by detonating a thermonuclear bomb with a force equal to 30,000,000 tons or more of TNT.

Two hours after this atmospheric explosion, a small atomic device was detonated beneath the water, the first underwater Soviet explosion to be announced.

Both explosions, the twenty-second and twenty-third to be announced by the United States since the Soviet Union resumed testing on Sept. 1, were conducted in the vicinity of the island of Novaya Zemlya, the Soviet Arctic testing ground between the Barents and Kara Seas.

The announcement from the Atomic Energy Commission said:

"The Atomic Energy Commission announced this afternoon that the Soviet Union today has carried out two nuclear test explosions in the Novaya Zemlya area. The first of these was detonated in the atmosphere.

"The yield of this test was very high, possibly as high as fifty megatons. Preliminary analysis indicates it was more probably on the order of thirty megatons. The second was detonated some two hours later under water south of the island of Novaya Zemlya.

"It was in the low-yield range."

A Day of Speculation

The commission's announcement was made shortly after 4 P. M., nearly twelve hours after the superbomb was believed to have lighted the Arctic skies with its huge, incandescent fireball.

The announcement followed an anxious day of speculation around the world that the Soviet Union might have carried out its plan to detonate a fifty-megaton explosion. A megaton is equal to 1,000,000 tons of TNT in explosive force.

Early in the day the Uppsala University Seismological Institution in Sweden reported picking up seismic and acoustic shock waves from what seemed to be a fifty-megaton explosion in the Novaya Zemlya area. Similar reports then came from the French Atomic Energy Commission and the Japanese Meteorological Agency.

From early morning, when word of the Soviet explosion began flashing around the world, United States officials were cautioning against speculation that the Soviet Union had actually conducted its planned fifty-megaton explosion. The official United States announcement was withheld for an hour while detection experts checked and re-

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The New York Times

Published: October 24, 1961

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SOVIET SETS OFF A RECORD BLAST

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checked their microbarographic readings of the pressure wave generated by the explosion in an attempt to determine its size.

Largest Previous Explosion

The Soviet explosion was twice as large as any previously conducted by man since he unleashed the power of the atom nearly two decades ago. The largest previously announced explosion was a fifteen-megaton blast set off by the United States at the Eniwetok Proving Grounds on March 1, 1954.

President Kennedy was informed of the Soviet explosion shortly after arising this morning at Newport, R. I., where he spent the week-end.

The White House had no immediate comment. Last week, when Premier Khrushchev announced that the test series would reach its climax in the detonation of a fifty-megaton device, the White House said such a test would "serve no legitimate purpose" and would only add to the radioactive fall-out unleashed by the intensive Soviet tests in the atmosphere.

The Soviet explosion can be expected to result in a perceptible rise in fall-out levels on the ground and food, particularly next spring.

While declining to fix its exact altitude, spokesman for the Atomic Energy Commission said the explosion took place beneath the tropopause, the boundary between the troposphere or lower atmosphere and the stratosphere. In the Arctic regions, the tropopause is usually around 30,000 feet.

Blown Into Stratosphere

In terms of fall-out, the altitude of the explosion meant that most of the radioactive debris would return to earth in relatively few months.

Some of the radioactive debris, carried by the prevailing westerly wind around the earth, will fall out on the Northern Hemisphere in the coming weeks. Most of the debris, however, was blown by the force of the explosion into the stratosphere, where it will remain for several months.

From experience with large Soviet explosions in the Arctic region, it can be expected that most of the radioactive debris from the latest explosion, as well as others in the test series, will fall to earth next spring and tend to concentrate in a band in the northern temperate zone around 40 degrees latitude.

Combined with the earlier Soviet explosions in September and October, the latest Soviet test will add nearly 30 per cent to all the radioactive debris created by atomic testing.

Could Have Used Rocket

As United States fall-out experts pointed out privately, the Soviet Union could have avoided this quick fall-out next spring by using one of its powerful rockets to send the device up to twenty or more miles in altitude before being triggered. Then the debris would probably have remained in the stratosphere for five years or more before falling to earth.

The unwillingness of the Atomic Energy Commission to give an exact estimate of the yield of the explosion sprang from the inherent inaccuracies of its global and still secret detection system. The primary method for detecting the Soviet atmospheric explosions is the acoustic, in which highly sensitive barometers, or microbarographs, record the air pressure waves that travel thousands of miles from a large explosion.

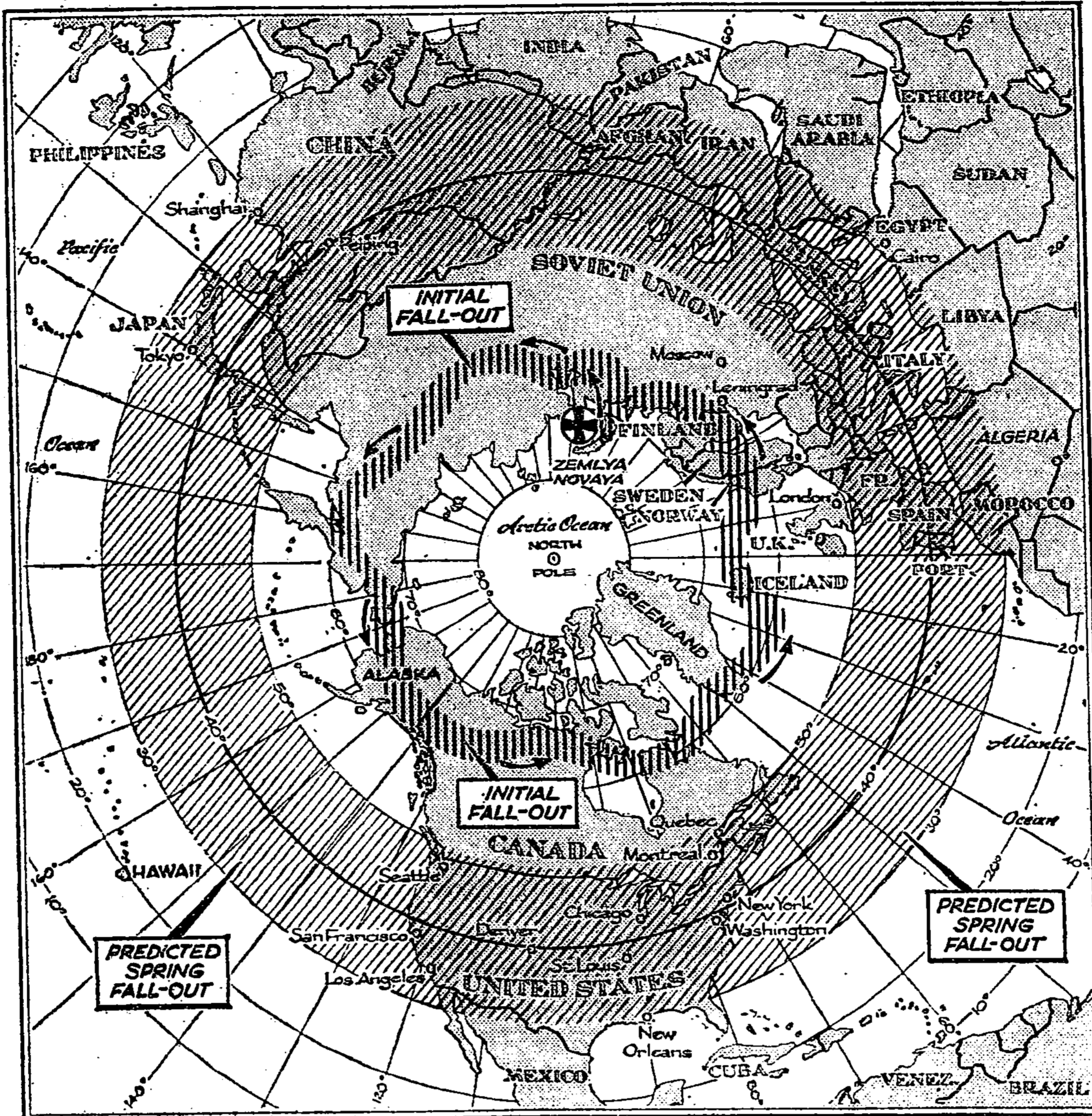
By studying the amplitude of these air pressure waves, which vary proportionately with yield and distance, it is then possible to reach estimates on the force of the explosion. These estimates, however, always have a "possible range of error." This explains why the commission was unwilling to state definitely that today's explosion did not reach fifty megatons.

More Accurate Method

This acoustic method, however, is far more accurate than the seismic method—used by some of the foreign observatories—of detecting an atmospheric explosion by observing the ground shock waves generated when the pressure wave from the explosion hits the earth. While not wishing to contradict the foreign observatories that first suggested a fifty-megaton explosion, commission officials believed their measurements were more accurate and that the explosion was more in the thirty-megaton range.

One theory within the Government was that the Soviet Union had attempted today to explode its vaunted fifty-megaton bomb but had fallen short.

Premier Khrushchev had originally stated last week that the fifty-megaton explosion would not come until Oct. 30 or 31 as a climax to the Soviet test series. Some Government officials, however, were speculating that the Russians had advanced the date of the test in an attempt to conclude it before the United Nations and other individual countries could pass



The New York Times Oct. 24, 1961
FALL-OUT PATH: The inner band shows the best estimate of United States Weather Bureau specialists of the route to be followed by initial fall-out from yesterday's Soviet blast (cross). According to some Government officials, the fall-out will become increasingly thin and probably be harmless by the time it reaches North America. Additional particles, suspended in the stratosphere, are expected to sink lower next spring and be carried to earth in the region centered on Latitude 40 North (outer band).

resolutions of condemnation over such an explosion.

The news of the explosion came in the midst of a debate in the United Nation's political committee on a seven-power resolution containing a "solemn appeal" to the Soviet Union not to conduct a fifty-megaton explosion.

In Oslo, the Norwegian Parliament was debating a resolution protesting Soviet atmospheric tests when word of the latest Soviet explosion was re-

ceived. The resolution was passed after an argument over whether it should be redrafted in stronger language.

Linked to Missile Problem

While United States officials have tended to dismiss such multi-megaton weapons as primarily "terror weapons," there was speculation in the Government that the thirty-megaton explosion might have been connected with the Moscow announcement today by Marshal Rodion Y. Malinovsky, Soviet

defense minister, that "the problem of destroying rockets in flight has been successfully solved."

Defense officials were not inclined to believe that the Soviet Union had "solved" the extremely complicated problem of an anti-missile defense any more than the Army had done with its Nike Zeus project. There was a suspicion, however, that today's explosion might be related to development of a warhead for such an anti-missile missile. Such a warhead

would neutralize an incoming missile with a tremendous burst of radiation and heat.

The underwater explosion was described by the commission as having taken place south of the Island of Novaya Zemlya. Its force was said to be in "the low yield range," meaning its power was measured in kilotons, or thousands of tons of TNT.

The underwater test, the first, as far as known, ever conducted by the Soviet Union, prompted speculation that its purpose was the development of an atomic depth charge.

The United States conducted an underwater explosion far off California in May, 1955, and now has atomic depth charges in use by the Navy.